

On page 2, please replace the following paragraph starting on line 28 and ending on line 31 to read:

Methods of forcing the binder precursor and solid particulates through a perforated substrate comprise extrusion, milling, calendering or combinations thereof. In a preferred embodiment, the method of forcing is provided by a size reduction machine, manufactured by Quadro Engineering Incorporated.

In the Claims:

Please cancel claims 1-29.

Please add new claims 30 - 105:

30. (New) A method for making agglomerate particles comprising the steps of:

- a) forcing a composition comprising a radiation curable polymerizable binder precursor and a plurality of solid particulates through a perforated substrate to form agglomerate precursor particles; and
- b) separating the agglomerate precursor particles from the perforated substrate; and
- c) irradiating the agglomerate precursor particles wherein radiation energy is transmitted from a radiation energy source to the agglomerate precursor particles to at least partially cure the binder precursor to provide agglomerate particles, and wherein the steps a), b), and c) are spatially oriented in a vertical and consecutive manner.

31. (New) A method according to claim 30, wherein the agglomerate particles are collected after the irradiation step.

32. (New) A method according to claim 30, wherein the irradiation step comprises a step of passing the agglomerate precursor particles into a first curing zone that contains the radiation source.

33. (New) A method according to claim 30, wherein the agglomerate particles are passed through a second curing zone, wherein energy is transmitted from an energy source to the agglomerate particles to further cure the agglomerate particles.

34. (New) A method according to claim 30, wherein the binder precursor is selected from the group consisting of epoxy resins, acrylated urethane resins, acrylated epoxy resins, ethylenically unsaturated resins, aminoplast resins having pendant unsaturated carbonyl groups, isocyanurate derivatives having at least one pendant acrylate group, isocyanate derivatives having at least one pendant acrylate group, and combinations thereof.

35. (New) A method according to claim 30, wherein the plurality of solid particulates is selected from the group consisting of fillers, plastic particulates, reinforcing particulates, inorganic binder precursor particulates, anti-static agents, lubricants, pigments, suspending agents, and combinations thereof.

36. (New) A method according to claim 30, wherein the agglomerate particles are filamentary shaped and have a length ranging from about 10 to about 1500 micrometers.

37. (New) A method according to claim 30, wherein the length of the agglomerate particles is in a range from about 20 to about 800 micrometers.

38. (New) A method according to claim 30, wherein the length of the agglomerate particles is in a range from about 50 to about 400 micrometers.

39. (New) A method according to claim 30, wherein the agglomerate particles have a substantially constant cross-sectional shape.

40. (New) A method according to claim 39, wherein the cross-sectional shape comprises circles, polygons or combinations thereof.

41. (New) A method according to claim 30, wherein the agglomerate precursor particles further comprise a modifying additive.

42. (New) A method according to claim 12, wherein the modifying additives are selected from the group consisting of coupling agents, grinding aids, fillers, inorganic binder precursors, surfactants, and combinations thereof.

43. (New) A method according to claim 30, wherein the step of forcing the composition through the perforated substrate to form the agglomerate particles is selected from the group consisting of extrusion, milling, and calendering.

44. (New) A method according to claim 30, wherein the radiation energy source is selected from the group consisting of electron beam, ultraviolet light, visible light, laser light, and combinations thereof.

45. (New) A method according to claim 32, wherein the radiation energy source is selected from the group consisting of electron beam, ultraviolet light, visible light, laser light, and combinations thereof.

46. (New) A method according to claim 33, wherein the energy source is selected from the group consisting of electron beam, ultraviolet light, visible light, microwave, laser light, thermal, and combinations thereof.

47. (New) A method according to claim 30, wherein steps (a), (b), and (c) are performed continuously.

48. (New) A method according to claim 33, wherein steps (a), (b), and (c) are performed sequentially and continuously.

49. (New) A method according to claim 30, wherein the plurality of solid particulates comprise from 5 to 95% by weight of the composition.

50. (New) A method according to claim 30, wherein the plurality of solid particulates comprise from 40 to 95% by weight of the composition.

51. (New) A method according to claim 30, wherein said composition is 100% solids.

52. (New) A method according to claim 30, wherein a size reduction step is performed on the agglomerate particles after the irradiation step.

53. (New) A method according to claim 33, wherein a size reduction step is performed on the agglomerate particles after being passed through the second curing zone.

54. (New) A method according to claim 52, wherein the size reduction step comprises the methods of milling, crushing and tumbling.

55. (New). A method according to claim 53, wherein the size reduction step comprises the methods of milling, crushing and tumbling.

56. (New) An agglomerate particle made according to claim 30.

57. (New) An inorganic aggregate precursor agglomerate particle made according to claim 30.

58. (New) A method according to claim 30, wherein the solid particulates comprise abrasive grains abrasive grains having a Mohs hardness of at least 8.

59. (New) A method according to claim 58, wherein the abrasive grains have a Mohs hardness of greater than 9.

60. (New) A method according to claim 58, wherein the abrasive grains comprise at least one of fused aluminum oxide abrasive grains, ceramic aluminum oxide abrasive grains, or alumina zirconia abrasive grains.

61. (New) A method according to claim 58, wherein the irradiation step includes passing the agglomerate precursor particles into a first curing zone that includes the radiation source.

62. (New) A method according to claim 58, wherein the agglomerate particles are collected after the irradiation step.

63. (New) A method according to claim 58, wherein the agglomerate particles are passed through a second curing zone, wherein energy is transmitted from an energy source to the agglomerate particles to further cure the agglomerate particles.

64. (New) A method according to claim 63, wherein the second curing zone includes a radiation energy source selected from the group consisting of electron beam, ultraviolet light, visible light, microwave, laser light, thermal, and combinations thereof.

65. (New) A method according to claim 63, wherein a size reduction step is performed on the agglomerate particles after the irradiation step.

66. (New) A method according to claim 58, wherein the binder precursor is selected from the group consisting of epoxy resins, acrylated urethane resins, acrylated epoxy resins, ethylenically unsaturated resins, aminoplast resins having pendant unsaturated carbonyl groups, isocyanurate derivatives having at least one pendant acrylate group, isocyanate derivatives having at least one pendant acrylate group, and combinations thereof.

67. (New) A method according to claim 58, wherein the agglomerate particles are filamentary shaped and have a length ranging from about 10 to about 1500 micrometers.

68. (New) A method according to claim 58, wherein the length of the agglomerate particles is in a range from about 20 to about 800 micrometers.

69. (New) A method according to claim 58, wherein the length of the agglomerate particles is in a range from about 50 to about 400 micrometers.

70. (New) A method according to claim 58, wherein the agglomerate particles have a substantially constant cross-sectional shape.

71. (New) A method according to claim 58, wherein the cross-sectional shape comprises circles, polygons or combinations thereof.

72. (New) A method according to claim 58, wherein the agglomerate precursor particles further comprise a modifying additive.

73. (New) A method according to claim 72, wherein the modifying additives are selected from the group consisting of coupling agents, grinding aids, fillers, inorganic binder precursors, surfactants, and combinations thereof.

74. (New) A method according to claim 58, wherein step (a) the step of forcing the composition through the perforated substrate to form the agglomerate particles is selected from the group consisting of extrusion and milling.

75. (New) A method according to claim 58, wherein the radiation energy source is selected from the group consisting of electron beam, ultraviolet light, visible light, laser light, and combinations thereof.

76. (New) A method according to claim 58, wherein steps (a), (b), and (c) are performed continuously.

77. (New) A method according to claim 58, wherein the plurality of abrasive grains comprise from 5 to 95% by weight of the composition.

78. (New) A method according to claim 58, wherein the plurality of solid particulates comprise from 40 to 95% by weight of the composition.

79. (New) A method according to claim 58, wherein a size reduction step is performed on the agglomerate particles after the irradiation step.

80. (New) A method according to claim 1, wherein the solid particulates comprise at least one of fused aluminum oxide abrasive grains, heat treated aluminum oxide abrasive grains, ceramic aluminum abrasive grains, or alumina-zirconia abrasive grains.

81. (New) A method according to claim 80, wherein the irradiation step includes passing the agglomerate precursor particles into a first curing zone that includes the radiation energy source.

82. (New) A method according to claim 80, wherein the agglomerate particles are collected after the irradiation step.

83. (New) A method according to claim 80, wherein step (c) includes a second curing zone wherein energy is transmitted from a radiation energy source to the agglomerate particles to further cure the agglomerate particles.

84. (New) A method according to claim 80, wherein the second curing zone includes a radiation energy source selected from the group consisting of electron beam, ultraviolet light, visible light, microwave, laser light, thermal, and combinations thereof.

85. (New) A method according to claim 82, wherein a size reduction step is performed on the agglomerate particles after the irradiation step.

86. (New) A method according to claim 80, wherein the binder precursor is selected from the group consisting of epoxy resins, acrylated urethane resins, acrylated epoxy resins, ethylenically unsaturated resins, aminoplast resins having pendant unsaturated carbonyl groups, isocyanurate derivatives having at least one pendant acrylate group, isocyanate derivatives having at least one pendant acrylate group, and combinations thereof.

87. (New) A method according to claim 80, wherein the agglomerate particles are filamentary shaped and have a length ranging from about 10 to about 1500 micrometers.

88. (New) A method according to claim 80, wherein the length of the agglomerate particles is in a range from about 20 to about 800 micrometers.

89. (New) A method according to claim 80, wherein the length of the agglomerate particles is in a range from about 50 to about 400 micrometers.

90. (New) A method according to claim 80, wherein the agglomerate particles have a substantially constant cross-sectional shape.

91. (New) A method according to claim 90, wherein the cross-sectional shape comprises circles, polygons or combinations thereof.

92. (New) A method according to claim 90, wherein the agglomerate precursor particles further comprise a modifying additive.

93. (New) A method according to claim 90, wherein the modifying additives are selected from the group consisting of coupling agents, grinding aids, fillers, inorganic binder precursors, surfactants, and combinations thereof.

94. (New) A method according to claim 90, wherein the second curing zone includes a radiation energy source selected from the group consisting of electron beam, ultraviolet light, visible light, microwave, laser light, thermal, and combinations thereof.

95. (New) A method according to claim 90, wherein steps (a), (b), and (c) are performed continuously.

96. (New) A method according to claim 90, wherein the plurality of abrasive grains comprise from 5 to 95% by weight of the composition.

97. (New) A method according to claim 90, wherein the plurality of solid particulates comprise from 40 to 95% by weight of the composition.

98. (New) A method according to claim 90, wherein a size reduction step is performed on the agglomerate particles after the irradiation step.

99. (New) A method of making an abrasive article comprising the steps of:

a) forcing a composition through a perforated substrate to form agglomerate precursor particles, the composition comprising a radiation curable polymerizable binder precursor and a plurality of abrasive grains; and

b) separating the agglomerate precursor particles from the perforated substrate;

c) irradiating the agglomerate precursor particles, wherein radiation energy is transmitted from a radiation energy source to the agglomerate precursor particles to at least partially cure the binder precursor to provide agglomerate particles; and

d) incorporating at least one agglomerate particle into an abrasive article, wherein steps a), b), and c) are spatially oriented in a vertical and consecutive manner.

100. (New) A method according to claim 99, wherein the abrasive article comprises a bonded abrasive article.

101. (New) A method according to claim 99, wherein the abrasive article comprises a coated abrasive article.

102. (New) A method according to claim 99, wherein the abrasive article comprises a nonwoven abrasive article.

103. (New) A method according to claim 99, wherein the abrasive grains have a Mohs hardness of at least 8.

104. (New) A method according to claim 99, wherein the abrasive grains comprise at least one of fused aluminum oxide abrasive grains, heat treated aluminum oxide abrasive grains, ceramic aluminum abrasive grains, or alumina-zirconia abrasive grains.

A version marked up to show changes made to the claim(s) relative to the previous version of the claim(s) is attached.

REMARKS

Claims 1-29 are cancelled. New claims 30-104 have been added. Claims 30-104 are pending.

In the specification at page 2, line 29, the spelling of the term "calandering" has been corrected to read "calendering".

Support for new claim 30 can be found for example, in originally filed claims 1 and 19.

Support for new claims 31-47 can be found, for example, in originally filed claims 2-18, respectively.

Support for claims 48-57 can be found, for example in originally filed claims 20-29, respectively.

Support for new claims 58 and 59 can be found, for example, in originally filed claims 1 and 19 and in the specification on page 12, lines 1-8.

Support for new claim 60 can be found, for example, in the specification on page 12, lines 8-20.

Support for new claim 61 can be found, for example, in originally filed claim 3.

Support for new claim 62 can be found, for example, in originally filed claim 2.

Support for new claim 63 can be found, for example, in originally filed claim 4.

Support for new claim 64 can be found, for example, in the specification on page 8, lines 1-3.

Support for new claim 65 can be found, for example, in originally filed claim 24.

Support for new claim 66 can be found, for example, in originally filed claim 5.

Support for new claim 67 can be found, for example, in originally filed claim 7.

Support for new claim 68 can be found, for example, in originally filed claim 8.

Support for new claim 69 can be found, for example, in originally filed claim 9.

Support for new claim 70 can be found, for example, in originally filed claim 10.

Support for new claim 71 can be found, for example, in originally filed claim 11.

Support for new claim 72 can be found, for example, in originally filed claim 12.

Support for new claim 73 can be found, for example, in originally filed claim 13.

Support for new claim 74 can be found, for example, in originally filed claim 14.

Support for new claim 75 can be found, for example, in originally filed claim 15.

Support for new claim 76 can be found, for example, in originally filed claim 18.

Support for new claim 77 can be found, for example, in originally filed claim 21.

Support for new claim 78 can be found, for example, in originally filed claim 22.

Support for new claim 79 can be found, for example, in originally filed claim 24.

Support for new claim 80 can be found, for example, in originally filed claim 1 and in the specification on page 12, lines 1-11.

Support for new claim 81 can be found, for example, in originally filed claim 3.

Support for new claim 82 can be found, for example, in originally filed claim 2.

Support for new claim 83 can be found, for example, in originally filed claim 4.

Support for new claim 84 can be found, for example, in the specification on page 8, lines 1-3.

Support for new claim 85 can be found, for example, in originally filed claim 24.

Support for new claim 86 can be found, for example, in originally filed claim 5.

Support for new claim 87 can be found, for example, in originally filed claim 7.

Support for new claim 88 can be found, for example, in originally filed claim 8.

Support for new claim 89 can be found, for example, in originally filed claim 9.

Support for new claim 90 can be found, for example, in originally filed claim 10.

Support for new claim 91 can be found, for example, in originally filed claim 11.

Support for new claim 92 can be found, for example, in originally filed claim 12.

Support for new claim 93 can be found, for example, in originally filed claim 13.

Support for new claim 94 can be found, for example, in the specification on page 8, lines

1-3.

Support for new claim 95 can be found, for example, in originally filed claim 18.

Support for new claim 96 can be found, for example, in originally filed claim 21.

Support for new claim 97 can be found, for example, in originally filed claim 22.

Support for new claim 98 can be found, for example, in originally filed claim 24.

Support for new claims 99-104 can be found, for example, in originally filed claim 1, and in the specification on page 12, lines 1-12 and on page 3, lines 24-27.

Examination and consideration of the application as amended is requested and allowance of claims 30 - 104, as amended, at an early date is solicited.

Respectfully submitted,

July 3, 2003
Date

By: Bradford B. Wright
Bradford B. Wright, Reg. No.: 34,459
Telephone No.: (651) 736-4172

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833